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# P2.1082 Heavy impurity transport in tokamaks with plasma flows and saturated 3D perturbations

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See full abstract here
http://ocs.ciemat.es/EPS2019ABS/pdf/P2.1082.pdf

Observations in JET hybrid scenarios show that early termination of the plasma can be caused by tungsten accumulation events, sometimes preceded by large living MHD perturbations [1]. Only recent investigations have been made into understanding the effects of 3D background rotation profiles and 3D MHD equilibria on the transport of heavy impurities. The VENUSLEVIS PIC code [2] has been used to follow heavy impurities in the presence of a 1/1 kink saturated 3D MHD equilibrium and strong toroidal rotation [3]. In the present work, a now selfconsistent treatment of the same problem is pursued. An implementation of the 3D centrifugal effects and 3D electrostatic potential correction on the VENUS-LEVIS code, based on the neoclassical 3D flow theory in [4] and the guiding center theory in [5], is presented. The code is used to follow heavy impurities on a 3D magnetic geommetry with 3D centrifugal effects, in order to understand how these 3D neoclassical effects will affect the overall neoclassical transport of heavy impurities. In particular, we focus our study on a saturated 1/1 internal kink mode as it has been seen in experiments that a correlation between this 3D magnetic structure and the inward flux of heavy impurities may exist. Simulations are performed to study this phenomena in both high (Pfirsch-Schlüter) and low (banana) collisionality regimes for the background ions in order to understand the impact of the saturated 1/1 internal kink mode on the peaking of tungsten distributions in JET hybrid scenarios exhibiting continuous 1/1 activity.
References
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